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PRELIMINARY REPORT

SMALL APERTURE FEASIBILITY STUDY
Work Order 2774

1. The 20mm [redacted] lens was checked out first. It did not cover the 24mm square format as required in the request, so it was abandoned as being undesirable. 25X1

2. The 30mm wide angle lens [redacted] was tried next since this modified version is presently being used [redacted]. 25X1 25X1

   a. The first three exposures on roll #1 were made at normal exposure with nothing in front of the lens. The next eight exposures were made through a .095 aperture positioned 9/16" from the front lens element (Illustration A). These were made to determine the exposure increase necessary to match a normally exposed negative, i.e. exposures 1 to 3 on this roll. The subsequent eight exposures were made through the same aperture but it was placed 1/8" from the front lens element (Illustration B).

   b. The next series of exposures were made through a .147 aperture at the same two distances as mentioned in para. 2a above.

3. Rolls #2, #3, and #4 were photographed [redacted] with different size apertures as follows: Roll #2, 5/32 aperture; Roll #3, 6/32 aperture; Roll #4, 7/32 aperture (Illustration C). All of these exposures were made at two stops larger than normal, based upon the findings of test roll #1. 25X1

4. Concluding Results (see Illustration also):

   a. Roll #1 indicated that the exposure must be increased four times (two stops) to render a fully exposed negative.

   b. With an aperture at a distance of 9/16" from the front of the lens, a format of 16mm diameter resulted when a .095 aperture was used and a format of 19.5mm diameter resulted from an aperture of .147". In like manner, a .095 aperture produced a 22.5mm diameter formal when placed at 1/8" from the lens and a .147 aperture produced a 25.5mm diameter format.

   c. Rolls #2, #3, and #4 produced the following comparison when the aperture was made in a tie clasp:

| Roll # | Aperture Size | Neg. Format |
|---|---|---|
| 2 | 5/32 | 19mm |
| 3 | 6/32 | 22mm |
| 4 | 7/32 | 23.5mm |

   d. Paragraph 4c above points out the fact that when the aperture is increased from 5 to 6/32nds, the negative format increased in diameter from 19mm to 22mm. However, when the aperture was increased another 1/32nd, the negative

format only increased from 22mm to 23.5mm, or half of what it had increased previously. In other words, the ratio of the aperture to the negative format diminished as the aperture size was increased.

5. Comments:

Due to the results arrived at in para. 4d above, no further tests were conducted until the requester states his desire for further investigation.

6. The four rolls of test film are attached herewith for your examination.

[redacted] 25X1

Mechanical Branch

[redacted] 25X1

Attachments:
Film